

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An interactive book reading system responsive to a human finger presence, the system comprising:

(a) a radio frequency (RF) scanning circuit configured to detect the presence of a human finger when the finger enters an RF field generated by the RF scanning circuit;

(b) a control circuit in communication with the RF scanning circuit;

(c) a memory in communication with the control circuit (610), the memory storing a plurality of audible messages; and

(d) an audible output device in communication with the control circuit, wherein the audible output device outputs at least one of the audible messages based on an analysis of the RF field performed by the control circuit when the finger enters the RF field;

~~wherein the RF scanning circuit comprises a matrix of conductive lines arranged as a plurality of spaced apart column conductive lines on a first major side of an electrically insulative sheet and a plurality of spaced apart row conductive lines transverse to the plurality of column conductive lines on a second major side of the electrically insulative sheet opposite the first side, wherein for each specific column conductive line:~~

~~(i) an RF signal is input into the specific column conductive line according to a predetermined input sequence as directed by a first coordinated control signal outputted by the control circuit; and~~

~~(ii) coupled RF signals received from the specific column conductive line by the plurality of row conductive lines are outputted according to a predetermined output sequence as directed by a second coordinated control signal outputted by the control circuit.~~

wherein the control circuit is configured to analyze and select as a probable user input a single probable human finger presence from among a plurality of possible human finger presences detected simultaneously by the scanning circuit;

wherein the scanning circuit includes a matrix of conductive lines arranged as a first plurality parallel to and spaced apart from one another and a second plurality oriented transversely to the first plurality of conductive lines, the second plurality being parallel to and

spaced apart from one another and separated from the first plurality of conductive lines by an electrically insulated layer;

wherein the matrix has a preferred orientation with a side most proximal a user designated as a southern side of the matrix and a side opposite from and most distal to the user and to the southern side designated as a northern side of the matrix; and

wherein the control circuit is configured to select from among the plurality of possible human finger presences sensed simultaneously by the scanning circuit, a single most northern possible human finger presence as the probable user input.

2. (Cancelled)

3. (Currently amended) The interactive book reading system of claim [[33]] 1 wherein the RF scanning circuit further comprises an RF oscillator which generates the RF signal that is input into the specific column conductive line.

4. (Currently amended) The interactive book reading system of claim 3 wherein the RF scanning circuit further comprises an input switching circuit in communication with the control circuit, the RF oscillator and the column conductive lines of the matrix, the input switching circuit receiving the first coordinated control signal from the control circuit and the RF signal generated by the RF oscillator, the input switching circuit sequentially routing the RF signal generated by the RF oscillator to each of the column conductive lines according to the predetermined input sequence.

5. (Currently amended) The interactive book reading system of claim 3 wherein the RF scanning circuit further comprises an output switching circuit in communication with the control circuit and the row conductive lines of the matrix, the output switching circuit receiving the second control signal from the control circuit and the coupled RF signals, the output switching circuit sequentially outputting the RF coupled signals according to the predetermined output sequence.

6. (Currently amended) The interactive book reading system of claim [[33]] 1 wherein the RF scanning circuit further comprises a bandpass processing circuit in communication with the control circuit and the matrix, the bandpass processing circuit amplifying and filtering the coupled RF signals, and routing the amplified and filtered coupled RF signals to the control circuit for analysis.

7. (Currently amended) The interactive book reading system of claim 6 wherein the amplified and filtered coupled RF signals are AC voltage sine wave signals.

8. (Currently amended) The interactive book reading system of claim 6 further comprising an AC to DC converter in communication with the control circuit and the bandpass processing circuit, wherein the AC to DC converter transforms a peak of the amplified and filtered coupled RF signals to DC level signals.

9. (Currently amended) The interactive book reading system of claim 6 wherein the bandpass processing circuit includes a bandpass filter and a bandpass amplifier.

10. - 12. (Cancelled)

13. (Currently amended) The interactive book reading system of claim 1 wherein the control circuit includes a microcontroller.

14. (Currently amended) A method of using the interactive book reading system of claim [[33]] 1 responsive to the presence of a human finger, the method comprising the steps of:

(a) detecting the human finger as the finger enters an RF field generated by the scanning circuit of the reading system; and

(b) outputting at least one of a plurality of stored audible messages based on an analysis of the RF field when the finger enters the RF field.

15. (Currently amended) The method of claim 14 wherein the first plurality of conductive lines are arranged as a plurality of spaced apart column conductive lines extending between the northern and southern sides of the matrix and wherein the second plurality of

conductive lines are arranged as a plurality of spaced apart row conductive lines generally perpendicular to the plurality of column conductive lines, and wherein step (a) further comprises:

(a)(i) inputting an RF signal into a specific one of the plurality of column conductive lines according to a predetermined input sequence;

(a)(ii) outputting coupled RF signals received from the specific column conductive line by the plurality of row conductive lines according to the predetermined output sequence; and

(a)(iii) repeating steps (a)(i) and (a)(ii) for each of the column conductive lines.

16. (Previously presented) The method of claim 15, further comprising analyzing one or more electrical characteristics of the coupled RF signals after the RF signal is input into all of the column conductive lines.

17. (Previously Presented) The method of claim 15, further comprising:

(c) amplifying and filtering the coupled RF signals; and

(d) transforming a peak of the amplified and filtered coupled RF signals to DC level signals.

18. (Canceled)

19. (Currently amended) ~~[[The]]~~ An interactive book reading system of claim 18 responsive to the presence of a human finger through pages of a book, the system comprising:

(a) a radio frequency (RF) scanning circuit configured to detect the presence and location of human fingers through multiple pages of a book when the fingers are within an RF field generated above the RF scanning circuit, the RF scanning circuit including a series of cross-points formed by a matrix of narrow trace width conductive lines arranged as a plurality of spaced apart column conductive lines on a first major side of an electrically insulative sheet and a plurality of spaced apart row conductive lines transverse to the plurality of column conductive lines on a second major side of the electrically insulative sheet opposite the first side, the width of the conductive lines being minimized to reduce capacitive couple effect between the conductive lines at the cross-points;

(b) a control circuit operatively connected with the plurality of column conductive lines and the plurality of row conductive lines and wherein for each specific column conductive line (i) an RF signal is input into the specific column conductive line according to a predetermined input sequence as directed by a first coordinated control signal outputted by the control circuit, and wherein (ii) coupled RF signals received from the specific column conductive line by the plurality of row conductive lines are outputted according to a predetermined output sequence as directed by a second coordinated control signal outputted by the control circuit;

(c) a sensor memory in communication with the RF scanning circuit and the control circuit so as to store one or more characteristics of the coupled RF signal from each cross-point;

(d) a content memory in communication with the control circuit and storing a plurality of audible messages associated with content of the book;

(e) an audible output device in communication with the control circuit, wherein the audible output device outputs at least one of the audible messages from the content memory based on an analysis of the RF field of each cross-point performed by the control circuit on the coupled RF signal characteristics stored in the sensor memory when the finger enters the RF field; and

(f) a dielectric spacer 0.06 inches or more thick positioned over the scanning circuit so as to separate at least a plurality of pages of a book positioned on the spacer from RF scanning circuit beneath the spacer and reduce effect of moisture on the sensitivity of the matrix; and wherein the scanning circuit detects human finger presences away from the matrix and spacer and above the plurality of pages through the plurality of pages and the spacer;

wherein the control circuit is configured to analyze and select as a probable user input a single probable human finger presence from among a plurality of possible human finger presences detected simultaneously by the scanning circuit;

wherein the first plurality of conductive lines are arranged parallel to one another and the second plurality of conductive lines are arranged parallel to one another;

wherein the matrix has a preferred orientation with a side most proximal a user designated as a southern side of the matrix and a side opposite from and most distal to the user and to the southern side designated as a northern side of the matrix; and

wherein the control circuit is configured to select from among the plurality of possible human finger presences sensed simultaneously by the scanning circuit, a single most northern possible human finger presence as the probable user input.

20. (Currently amended) ~~[[The]]~~ An interactive book reading system of claim 33 responsive to the presence of a human finger through pages of a book, the system comprising:

(a) a radio frequency (RF) scanning circuit configured to detect the presence and location of human fingers through multiple pages of a book when the fingers are within an RF field generated above the RF scanning circuit, the RF scanning circuit including a series of cross-points formed by a matrix of narrow trace width conductive lines arranged as a plurality of spaced apart column conductive lines on a first major side of an electrically insulative sheet and a plurality of spaced apart row conductive lines transverse to the plurality of column conductive lines on a second major side of the electrically insulative sheet opposite the first side, the width of the conductive lines being minimized to reduce capacitive couple effect between the conductive lines at the cross-points;

(b) a control circuit operatively connected with the plurality of column conductive lines and the plurality of row conductive lines and wherein for each specific column conductive line (i) an RF signal is input into the specific column conductive line according to a predetermined input sequence as directed by a first coordinated control signal outputted by the control circuit, and wherein (ii) coupled RF signals received from the specific column conductive line by the plurality of row conductive lines are outputted according to a predetermined output sequence as directed by a second coordinated control signal outputted by the control circuit;

(c) a sensor memory in communication with the RF scanning circuit and the control circuit so as to store one or more characteristics of the coupled RF signal from each cross-point;

(d) a content memory in communication with the control circuit and storing a plurality of audible messages associated with content of the book;

(e) an audible output device in communication with the control circuit, wherein the audible output device outputs at least one of the audible messages from the content memory based on an analysis of the RF field of each cross-point performed by the control circuit on the

coupled RF signal characteristics stored in the sensor memory when the finger enters the RF field; and

(f) a dielectric spacer 0.06 inches or more thick positioned over the scanning circuit so as to separate at least a plurality of pages of a book positioned on the spacer from RF scanning circuit beneath the spacer and reduce effect of moisture on the sensitivity of the matrix; and wherein the scanning circuit detects human finger presences away from the matrix and spacer and above the plurality of pages through the plurality of pages and the spacer; and

wherein the control system is further configured to select from the plurality of possible human finger presences detected by the scanning array as the probable user input one of at least two of the possible human finger presences sensed by the scanning array to be most northern of all the plurality and at least approximately equally most northern on the matrix.

21. (Currently amended) The interactive book reading system of claim [[33]] 1 wherein the control circuit is further configured to select from among a plurality of possible human finger presences detected at least generally simultaneously by the scanning circuit as a probable user input, a single sensed possible human finger presence that extends from and yet adjoins on one side a cluster of the plurality of possible human finger presences sensed by the scanning circuit, wherein the single sensed possible human finger presence that extends need not be the single most northern possible human presence sensed.

22. (Currently amended) The interactive book reading system of claim [[33]] 1 wherein the control circuit is further configured to select from among the plurality of stored audible messages an audible message instructing the user to make another selection if the control circuit is unable to select the probable user input from among a plurality of possible human finger presences sensed at least generally simultaneously by the scanning circuit.

23. (Currently amended) A method of using the interactive book reading system of claim [[33]] 1, the method comprising the steps of:

(a) detecting the human finger as the finger enters an RF field generated by the scanning circuit of the reading system;

(b) outputting at least one of a plurality of stored audible messages based on an analysis of the RF field when the finger enters the RF field; and

between the detecting and outputting steps, the steps of analyzing and first selecting from among a plurality of possible human finger presences detected at least generally simultaneously entering the RF field, a single possible human finger entry as a probable user input and further selecting based upon the probable user input, at least one of the stored audible messages.

24. (Currently amended) The method of claim 23 ~~wherein the RF field has a preferred orientation with a side most proximal a user designated as a southern side and a side opposite from and most distal to the user and to the southern side designated as a northern side; and wherein the first selecting step further comprises selecting from among the plurality of possible human finger presences detected at least generally simultaneously entering the RF field, a single most northern point of detected RF field entry as the probable user input.~~

25. (Cancelled)

26. (Currently amended) The method of claim 23 wherein the first selecting step further comprises selecting as the user input, a single sensed possible human finger RF field entry that extends from and yet adjoins on one side of a cluster of the detected plurality of possible human finger RF field entry locations, wherein the single sensed possible human finger presence that extends need not be the single most northern possible human presence sensed.

27. (Previously presented) The method of claim 23 wherein the outputting step comprises instructing the user to make another selection if the system is unable to select the probable user input from among a plurality of possible human finger RF field entries detected at least generally simultaneously entering the RF field.

28. (Previously presented) The interactive book reading system of claim 19 wherein: ~~the matrix has a preferred orientation with a side most proximal a user designated as a southern side of the matrix and a side opposite from and most distal to the user and to the southern side designated as a northern side of the matrix; and~~

the control system is further configured to select from the plurality of possible human finger presences detected by the scanning array as the probable user input one of at least two of the possible human finger presences sensed by the scanning array to be most northern of all the plurality and at least approximately equally most northern on the matrix.

29. (Currently amended) The interactive book reading system of claim [[33]] 1 wherein the first plurality of conductive lines are arranged as a plurality of spaced apart column conductive lines extending between the northern and southern sides of the matrix and wherein the second plurality of conductive lines are arranged as a plurality of spaced apart row conductive lines generally perpendicular to the plurality of column conductive lines, and further comprising a signal generator configured to generate at a predetermined frequency, the RF signal input into the specific column conductive line and wherein the radio frequency scanning circuit further comprises a bandpass filter selected to pass to the control circuit only those coupled signals from the plurality of row conductive lines at the predetermined frequency.

30. (Previously presented) The method of claim 15 wherein the inputting step comprises providing the RF signal at a predetermined frequency to input into the specific one of the plurality of column conductive lines and wherein the outputting step further comprises outputting only coupled RF signals at the predetermined frequency for the detecting step.

31. (Currently amended) The interactive book reading system of claim [[33]] 1 wherein the first plurality of conductive lines are arranged as a plurality of spaced apart column conductive lines extending between the northern and southern sides of the matrix and wherein the second plurality of conductive lines are arranged as a plurality of spaced apart row conductive lines generally perpendicular to the plurality of column conductive lines, and wherein the memory is further configured to store a DC peak of the received RF signals from each of the column conductive lines for each row conductive line and wherein the control circuit is configured to compare the stored DC peak of the received RF signals with a DC peak of the subsequently received RF signals from the same row conductive line-column conductive line pairs to locate a detected human figure with respect to the matrix.

32. (Previously presented) The method of claim 15 further comprising the steps of storing a DC peak of the received RF signals from each of the column conductive lines for each row conductive line and thereafter comparing the stored DC peak of the received RF signals with a DC peak of the subsequently received RF signals from the same row conductive line-column conductive line pairs to locate a detected human figure with respect to the matrix.

33. (Cancelled)

34. (Cancelled)

35. (Currently amended) The interactive book reading system of claim ~~[[33]]~~ 1 wherein ~~the control circuit analyzes and selects as a probable user input, a single probable human finger presence from among a plurality of possible human finger presences detected simultaneously by the scanning circuit by the control circuit~~ [[being]] is further configured to:

read and store values of cross-points of the matrix from an original scan without a human presence in the RF field to obtain a reference value for each cross-point of the matrix; and

compare successive scans of values from the cross-points of the matrix with the reference values of the cross-points to determine the proximity of a human finger.

36. (Previously presented) The interactive book reading system of claim 35 wherein the control circuit is configured to analyze and select as a probable user input, a single probable human finger presence from among a plurality of possible human finger presences detected simultaneously by being configured to calculate a dynamic threshold of the matrix for each scan of the matrix after the initial reference value generating scan.

37. (Previously presented) The interactive book reading system of claim 36 wherein the control circuit is configured to calculate the dynamic threshold by being configured to:

difference a currently measured value from each cross-point with the reference value of the cross-point to generate a current difference value for each cross-point;

determine a highest current difference value for each of a number of the row conductive lines scanned;

sum together the highest current difference values for the number of row conductive lines scanned and divide the sum by the number to identify a dynamic threshold for the scan;

identify current difference values of the scan greater than the dynamic threshold for the scan to identify each cross-point generating one of the identified current difference values as a probable human finger presence.